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Applicant	:	R. Cahn	
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Group Art Unit	:	2154	
Examiner	:	K. Lin	
Docket No.	:	1999-0414	
Title	:	METHOD FOR MONITORING A NETWORK	

Commissioner for Patents
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APPEAL BRIEF

I. Real Party In Interest

The real party in interest in this appeal is AT&T Corp., the assignee of the entire right, title and interest to this invention as per the Assignment and Agreement recorded in the United States Patent and Trademark Office at Reel/Frame 011127/0903.

II. Related Appeals and Interferences

There are no other prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. Status of Claims

Claims 1-8 are pending in this application. All claims stand rejected. The rejection of all pending claims is appealed.

IV. Status of Amendments

No amendment has been filed subsequent to the final rejection.

V. Summary of Claimed Subject Matter

Independent claim 1 is directed to a method for monitoring the status of a network. The method includes the step of computing a plurality of measures of network health. These measures of network health are further claimed as including three particular types of measures of network health as follows:

- a sum of unrouted traffic
- a sum of traffic whose cost exceeds a prescribed multiple of an optimal route cost; and
- a sum of traffic off an optimal path.

Unrouted traffic is the network traffic that cannot be routed to its destination, for example due to a network failure that separates the network into two disconnected pieces or due to network congestion. In this situation, there is no alternative route possible, and the network health method will report the sum of the unrouted traffic. (See Specification p. 3, line 27 – p. 4, line 5).

Traffic whose cost exceeds a prescribed multiple of an optimal route cost is traffic that is routable from the source to the destination, but is seriously misrouted because of the cost of route. Each "hop" of a route is associated with a cost. (Specification p. 3, lines 2-4, and Fig. 1 showing cost of each hop). The cost of the optimal route is compared to the cost of the actual route to determine if the actual route cost exceeds the optimal cost route by a prescribed multiple. (See Specification p. 4, lines 15-26). If the actual route cost exceeds the optimal route cost by a prescribed multiple, then the traffic is considered as "traffic whose cost

exceeds a prescribed multiple of an optimal route cost". If the traffic is off the optimal path, but the actual route cost does not exceed the optimal route cost by a prescribed multiple, then the traffic is considered as "traffic off an optimal path". (See Specification p. 4, lines 15-26). Thus, the computing step of independent claim 1 includes the computation of three specific measures of network health, which may be used in various ways to monitor and maintain the network.

Independent claim 5 is an independent claim directed to a system for monitoring the status of a network. Claim 5 contains the limitation of a computer (See specification page 2, line 29 – page 3, line 2) for computing the plurality of measures of network health described above in connection with independent claim 1.

Dependent claims 6-8 contain means plus function limitations as permitted by 35 U.S.C. §112, ¶6. For each of the claimed functions in these means plus function claims, the corresponding structure described in the specification is one or more network nodes (e.g., router) which includes a data processor, and the claimed functions may be implemented as a computer program executed on the data processor in the one or more network nodes, either in a distributed manner or by a central data processor. (See specification page 2, line 29 – page 3, line 2). The network nodes are shown generally in Figs. 1-7.

VI. Grounds of Rejection to Be Reviewed on Appeal

The grounds for rejection presented for review are:

1. Are claims 1 and 5 unpatentable under 35 U.S.C. 103(a) in view of U.S. Patent No. 6,256,295 (Callon) and "Official Notice"?
2. Are claims 2 and 6 unpatentable under 35 U.S.C. 103(a) in view of Callon and U.S. Patent No. 6,282,170 (Bentall et al.)?
3. Are claims 3, 4, 7 and 8 unpatentable under 35 U.S.C. §103(a) in view of Callon and U.S. Patent No. 6,304,549 (Srinivasan et al.)?

VII. <u>Argument</u>

1. <u>Claims 1 and 5 are patentable in view of Callon and "Official Notice"</u>

Independent claim 1 contains limitations directed to computing three measures of network health. More particularly, claim 1 contains the limitation of:

> computing a plurality of measures of network health, including a sum of unrouted traffic, a sum of traffic whose cost exceeds a prescribed multiple of an optimal route cost, and a sum of traffic off an optimal path.

Thus, claim 1 claims particular computations that are made. The first computation is "a sum of unrouted traffic" which is a measure of network traffic which cannot be routed to its destination. Traffic may be unrouted, for example, if the path between the source and the destination has failed or if the path between the source and the destination is too congested to carry the traffic (i.e., the links are saturated). The second claimed computation is "a sum of traffic whose cost exceeds a prescribed multiple of an optimal route cost". Here, the cost of the optimal route is compared to the cost of the actual route to determine if the actual route cost exceeds the optimal route cost by a prescribed multiple. If the actual route cost exceeds the optimal route cost by a prescribed multiple, then the traffic is considered as "traffic whose cost exceeds a prescribed multiple of an optimal route cost". If the traffic is off the optimal path, but the actual route cost does not exceed the optimal route cost by a prescribed multiple, then the traffic is considered as "traffic off an optimal path", which is the third claimed computation.

In the embodiment described in the application, the multiple is expressed as a ratio, whereby if the ratio of cost between the actual route and the shortest route is greater than 1.5 then the traffic is considered to be seriously misrouted. If the ratio is less than 1.5, then the traffic is considered to be off the optimal traffic path. The claimed computations of claim 1 are not disclosed in the cited art.

The Office Action dated January 10, 2005 (the "Office Action") in paragraph 4 cites Callon at col. 3, lines 1-4 and 58-67; col. 5, lines 3-11, 11-20 and 25-25. However, these cited portions do not disclose the claimed limitations of claim 1. Callon is directed to a method for determining multiple minimally-overlapping paths between a source node and a destination node (Callon col. 1, lines 52-54). The paths determined in connection with the Callon method are used to establish multiple virtual circuits between a source node and a destination node of a network, thereby allowing redundant virtual circuits and fast switch-over in the event of a failure along one of the paths. (Col. 2, lines 48-52). Thus, as can be seen, Callon is directed to determining backup paths to prepare for network problems, but is not directed to monitoring the status of an operating network in order to diagnose problems as in the present invention. Thus, none of the cited portions of Callon disclose the particular claimed measurements of claim 1.

In particular, col. 3, lines 1-4 of Callon merely discloses switched virtual circuits and permanent virtual circuits, but contains no disclosure of any computations. Col. 3, lines 58-67 merely discusses the determination of lowest cost paths. As described in the specification of the present application at page 6, lines 15-18, shortest path algorithms are well known, and are not the subject of the present invention. Callon at col. 5, lines 3-11, 11-20 and 25-25 (or more generally lines 3-25) merely provides further details of the use of a Dijkstra algorithm to determine the best path between a network source node and destination node. Again, claim 1 does not claim computations relating to a shortest path algorithm, and as such the cited portions of Callon do not render claim 1 obvious.

It is noted that the Office Action relies primarily on Callon as disclosing all of the limitations of claim 1. The Office Action relies on "Official Notice" only for the function of computing a "sum" of the various categories of traffic. More particularly, the Office Action in paragraph 5 states the official notice that was takes as follows:

> Official Notice is taken that it would have been obvious to calculate a sum of each category of the determined traffic by simply adding each indication.

Further, the Office Action states that "because Applicants have failed to challenge any of the Examiner's 'Official Notices' stated in the previous office action in a proper and reasonably manner, they are now considered as admitted prior art. See MPEP 2144.03". The Official Notice taken by the Examiner, as well as the statement that such Official Notice has been admitted, are both improper.

First, MPEP 2144.03 states that "[i]n limited circumstances, it is appropriate for an examiner to take official notice of **facts** not in the record or to rely on "common knowledge" in making a rejection, however such rejections should be judiciously applied." (emphasis added). Thus, Official Notice may be used to establish a fact, upon which a conclusion may be based. However, the Examiner in the present application took official notice that "it would have been **obvious** to calculate a sum of each category of the determined traffic by simply adding each indication." (emphasis added). This is improper, as the question of obviousness is a question of law, not a fact which can be officially noticed. Aktiebolaget Karlstads Mekaniska Werkstad v. United States International Trade Com., 705 F.2d 1565, 1575, 217 U.S.P.Q. 865,___ (Fed. Cir., 1983) (Obviousness is a legal conclusion based on factual determinations and not a factual determination itself.) Since the question of obviousness is one of law, which cannot be officially noticed, the Examiner's Official Notice in the present application is improper.

Further, the assertion by the Examiner that Applicants have failed to challenge any of the Examiner's Official Notices is incorrect. The Official Notice was first taken in the Office Action dated April 29, 2004. As stated above, the Examiner took Official Notice that it would have been obvious to calculate a sum of each category of the determined traffic by simply adding each indication. In Applicant's response dated August 26, 2004, Applicant clearly argued against obviousness, and therefore did challenge the Examiner's Official Notice.

If the Examiner's Official Notice was merely notice that a "sum" of numbers may be determined by adding those numbers together (i.e., the definition of the mathematical term "sum") then Applicant does not challenge such assertion and admits that the sum of numbers may be determined by adding those numbers together. Any Official Notice beyond this definition was not, and is not, admitted by Applicant.

For the reasons discussed above, Callon in view of Official Notice does not render claim 1 obvious.

Independent claim 5 contains limitations directed to computing the three measures of network health as discussed above. More particularly, claim 5 contains the limitation of:

> a computer for computing a plurality of measures of network health, including a sum of unrouted traffic, a sum of traffic whose cost exceeds a prescribed multiple of an optimal route cost, and a sum of traffic off an optimal path.

These limitations render claim 5 allowable over the cited art for the same reasons as discussed above in connection with claim 1.

2. <u>Claims 2 and 6 are patentable in view of Callon and Bentall et al.</u>

Dependent claims 2 and 6 are directed to the aspect of the invention of "restoring circuits at a rate parameterized by a value P" and "increasing the value P in the network to decrease the time customers experience unrouted traffic". Thus, these claims are directed to circuit restoration at a particular rate (parameterized by P) and increasing the rate of circuit restoration. The Office Action admits that Callon does not disclose these limitations, and relies upon Bentall et al. as providing the missing disclosure. However, the cited portion of Bentall et al. fails to provide the missing disclosure. First, at col. 3, lines 37-41, Bentall et al. discloses using a local node to select a restoration route which may enhance response. However, there is no disclosure of restoring circuits by a

particular rate and increasing the rate as claimed in claims 2 and 6. Further, at col. 4, lines 29-34, Bentall et al. discloses shortening a restoration route, which is different from increasing the rate at which circuits are restored. For these reasons, claims 2 and 6 are allowable over the cited art.

3. <u>Claims 3, 4, 7 and 8 are patentable in view of Callon and Srinivasan et al.</u>

    a. <u>Claims 3 and 7</u>

Dependent claims 3 and 7 contain limitations directed to "monitoring said measures to sense when bandwidth needs to be added to the network". The Office Action, in paragraph 10, rejected claims 3 and 7 citing col. 15, lines 55-64 of Srinivasan et al. and stating "Srinivasan taught to monitor **said measures** to sense when bandwidth needs to be added to the network". (emphasis added). The term "said measures" in claims 3 and 7, however, relates back to the plurality of measures from claims 1 and 5 respectively. As described above in connection with claims 1 and 5, the claimed measures include the three particular measures discussed above. There is no disclosure in the cited art of using these particular measures to sense when additional bandwidth is necessary. As such, claims 3 and 7 are allowable over the cited art.

    b. <u>Claims 4 and 8</u>

Dependent claims 4 and 8 both contain limitations directed to "derating each edge of the network to have capacity of a predetermined fraction of real capacity". The Office Action in paragraph 12 admits that Callon does not disclose this limitation. The Office Action relies on Srinivasan et al. at col. 15, lines 43-50 and 55-58 (disclosing the lowering of assigned bandwidth) as disclosing this limitation. However, lowering the assigned bandwidth is not the same as "derating each edge of the network to have capacity of a predetermined fraction of real capacity". Srinivasan et al. does not disclose this entire claim limitation

(e.g., "predetermined fraction of real capacity"). Since Srinivasan et al. does not supply the missing disclosure, claims 4 and 8 are allowable over the cited art.

Respectfully submitted,

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VIII. Claims Appendix

1. A method for monitoring the status of a network comprising:

computing a plurality of measures of network health, including a sum of unrouted traffic, a sum of traffic whose cost exceeds a prescribed multiple of an optimal route cost, and a sum of traffic off an optimal path; and

comparing said measures of network health to a threshold value and selecting a restoration route from a plurality of stored restoration routes.

2. The method for monitoring the status of a network of claim 1, which further comprises:

restoring circuits at a rate parameterized by a value P and observing the behavior of the network; and

increasing the value P in the network to decrease the time customers experience unrouted traffic.

3. The method for monitoring the status of a network of claim 1, which further comprises:

monitoring said measures to sense when bandwidth needs to be added to the network.

4. The method for monitoring the status of a network of claim 1, which further comprises:

derating each edge of the network to have capacity of a predetermined fraction of real capacity;

computing said plurality of measures of network health to identify unrouted, off optimal, and seriously misrouted traffic;

determining if the measures are over a specified value and if so, then adding capacity to the network.

5. A system for monitoring the status of a network, comprising:

a database storing possible restoration routes;

a computer for computing a plurality of measures of network health, including a sum of unrouted traffic, a sum of traffic whose cost exceeds a prescribed multiple of an optimal route cost, and a sum of traffic off an optimal path; and

said computer comparing said measures of network health to a threshold value and selecting a restoration route from said database storing restoration routes.

6. The system for monitoring the status of a network of claim 5, which further comprises:

means for restoring circuits at a rate parameterized by a value P and observing the behavior of the network; and

means for increasing the value P in the network to decrease the time customers experience unrouted traffic.

7. The system for monitoring the status of a network of claim 5, which further comprises:

means for monitoring said measures to sense when bandwidth needs to be added to the network.

8. The system for monitoring the status of a network of claim 5, which further comprises:

means for derating each edge of the network to have capacity of a predetermined fraction of real capacity;

said computer computing said plurality of measures of network health to identify unrouted, off optimal, and seriously misrouted traffic;

means for determining if the measures are over a specified value and if so, then adding capacity to the network.

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None